CLAIMS

What is claimed is:

1 1. A computer system, comprising:

2 a self powered device;

3 a laptop computer coupled to said self powered device by way of a communication bus;

4 and

5 said laptop computer powered by said self powered device across power lines of said

6 communication bus.

1 2. The computer system as defined in claim 1 further comprising:

2 said self powered device comprises a docking station;

3 said laptop computer comprising:

4 a processor;

5 a system memory coupled to said processor by way of a host bridge device;

6 a second bridge device coupled to said host bridge device by way of a primary

7 expansion bus, said second bridge device adapted to communicate over said communication bus

8 being a Universal Serial Bus (USB) interface;

9 a system battery coupled to said processor and bridge devices; and

10 a laptop docking logic coupled to said system battery and power rails of said USB

11 interface, said laptop docking logic adapted to couple power from said USB power rails to said

12 system battery; and

13 said docking station comprising a dock station docking logic adapted to determine whether

14 said laptop computer is capable of receiving power across said USB interface, said dock station

15 docking logic further adapted to provide power to said laptop on said power rails of said USB

16 interface.

1 3.   The computer system as defined in claim 2 wherein said laptop docking logic further

2 comprises:

3   a voltage control unit coupled to said USB power rails and said system battery, said voltage

4 control unit adapted to couple power from said USB power rails; and

5   a signaling circuit coupled to said USB power rails, said signaling circuit adapted to

6 respond to communication signals on said power rails to identify said laptop as being capable of

7 receiving power on said USB power rails.

1 4.   The computer system as defined in claim 3 wherein said voltage control unit further

2 comprises:

3   a five volt supply input signal, said voltage control unit adapted to selectively couple said

4 five volt supply input signal to said positive power rail; and

5   a shut off input signal, said voltage control unit adapted to de-couple said five volt supply

6 input signal from a positive power rail responsive to assertion of said shut off signal.

1 5.   The computer system as defined in claim 3 wherein said signaling circuit further

2 comprises:

3   a line powered serial communication device coupled across said USB power rails, said

4 communication device adapted to respond to communication signals to identify said laptop

5 computer as capable of receiving power across said USB power rails; and

6   a coupling current logic coupled across said USB power rails adapted to draw a current

7 across said USB power rails to indicate the presence of a laptop computer capable of receiving

8 power across said USB power rails.

1 6. The computer system as defined in claim 5 wherein said line powered serial

2 communication device further comprises a Dallas Semiconductor device DS2401.

1 7. The computer system as defined in claim 2 wherein said dock station docking logic further

2 comprises:

3   a communication and control logic coupled to said USB power rails adapted to serially

4 communicate over said USB power rails;

5   a current sense logic adapted to sense current flowing from the docking station to the laptop

6 computer; and

7   a voltage ramp logic adapted to selectively supply power to said laptop across said USB

8 power rails.

1 8. The computer system as defined in claim 7 wherein said communication and control logic

2 further comprises a Programmable Array Logic (PAL) configured to operate as a state-machine.

1 9. The computer system as defined in claim 7 further comprising:

2   said current sense logic adapted to generate a shut-off signal when current flow from said

3 docking station to said laptop falls below a predefined minimum; and

4   said communication and control logic coupled to said shut-off signal and adapted to turn

5   off power supplied from said docking station to said laptop computer responsive to assertion of

6   said shut-off signal.

1   10.   In a computer system comprising a laptop computer adapted to dock to a docking station by

2   way of a communication bus, a method of operating said computer system comprising:

3   powering said laptop computer from said docking station across said USB interface.

1   11.   The method as defined in claim 10 further comprising:

2   coupling an operating laptop computer to said docking station;

3   communicating over serial communication lines of said communication bus;

4   determining that said docking station is capable of supply power across said

5   communication bus;

6   discontinuing application of voltage to power lines of said communication bus by said

7   laptop computer; and

8   providing power on said power lines of said communication bus by said docking station.

1   12.   The method as defined in claim 11 wherein said communication bus is a Universal Serial

2   Bus.

1   13.   The method as defined in claim 10 further comprising:

2   coupling a laptop computer to said docking station by way of said communication bus;

3   communicating over power signal lines of said communication bus;

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4   determining that said laptop is capable of receiving power over said power signal lines of

5   said communication bus; and

6   providing power on said power signal lines of said communication bus by said docking

7   station.

1   14.   The method as defined in claim 13 wherein said communication bus is a Universal Serial

2   Bus.

1   15.   A computer comprising:

2   a processor;

3   a system memory coupled to said processor;

4   a bridge device coupled to said processor, said bridge device having a Universal Serial Bus

5   (USB) interface;

6   a system battery coupled to said processor and bridge devices; and

7   a docking logic coupled to said system battery and power rails of said USB interface, said

8   docking logic adapted to couple power from said USB power rails to said system battery.

1   16.   The laptop computer as defined in claim 15 wherein said docking logic further comprises:

2   a voltage control unit coupled to said USB power rails and said system battery, said voltage

3   control unit adapted to selectively provide power to said USB power rails; and

4   a signaling circuit coupled to said USB power rails, said signaling circuit adapted to

5   respond to communication signals on said USB power rails to identify said laptop as capable of

6   receiving power on said USB power rails.

1   17.   The laptop computer as defined in claim 16 wherein said voltage control unit further

2   comprises:

3   a five volt supply input signal, said voltage control unit adapted to selectively couple said

4   five volt supply input signal to a positive power rail; and

5   a shut-off input signal, said voltage control unit adapted to de-couple said five volt supply

6   input signal from said positive power rail responsive to assertion of said shut-off signal.

1   18.   The laptop computer as defined in claim 16 wherein said signaling circuit further

2   comprises:

3   a line powered serial communication device coupled across said USB power rails, said

4   communication device adapted to respond to communication signals on said positive power rail to

5   identify said laptop computer as capable of receiving power across said USB power rails; and

6   a coupling current logic coupled across said USB power rails adapted to draw a current

7   from said USB power rails when a voltage on said USB power rails exceeds a threshold voltage.

1   19.   The laptop computer as defined in claim 18 wherein said line powered serial

2   communication device further comprises a Dallas Semiconductor device DS2401.

1   20.   A docking station for mating with a laptop computer comprising:

2   a Universal Serial Bus (USB) interface having data signal lines and power rails that couple

3   to the laptop computer; and

4   a docking logic that provides power to said laptop over the power rails of the USB

5   interface.

1   21.   The docking station as defined in claim 20 wherein said docking logic further comprises:

2   a communication and control logic coupled to said USB power rails adapted to serially

3   communicate over said USB power rails;

4   a current sense logic adapted to sense current flowing from the docking station; and

5   a voltage ramp logic adapted to selectively couple power to said USB power rails.

1   22.   The docking station as defined in claim 21 wherein said communication and control logic

2   further comprises a Programmable Array Logic (PAL) configured to operate as a state-machine.

1   23.   The docking station as defined in claim 21 further comprising:

2   said current sense logic adapted to generate a shut-off signal when current flow from said

3   docking station to said laptop falls below a predefined minimum; and

4   said communication and control logic coupled to said shut-off signal and adapted to initiate

5   cut-off of power supplied from said docking station responsive to assertion of said shut-off signal.